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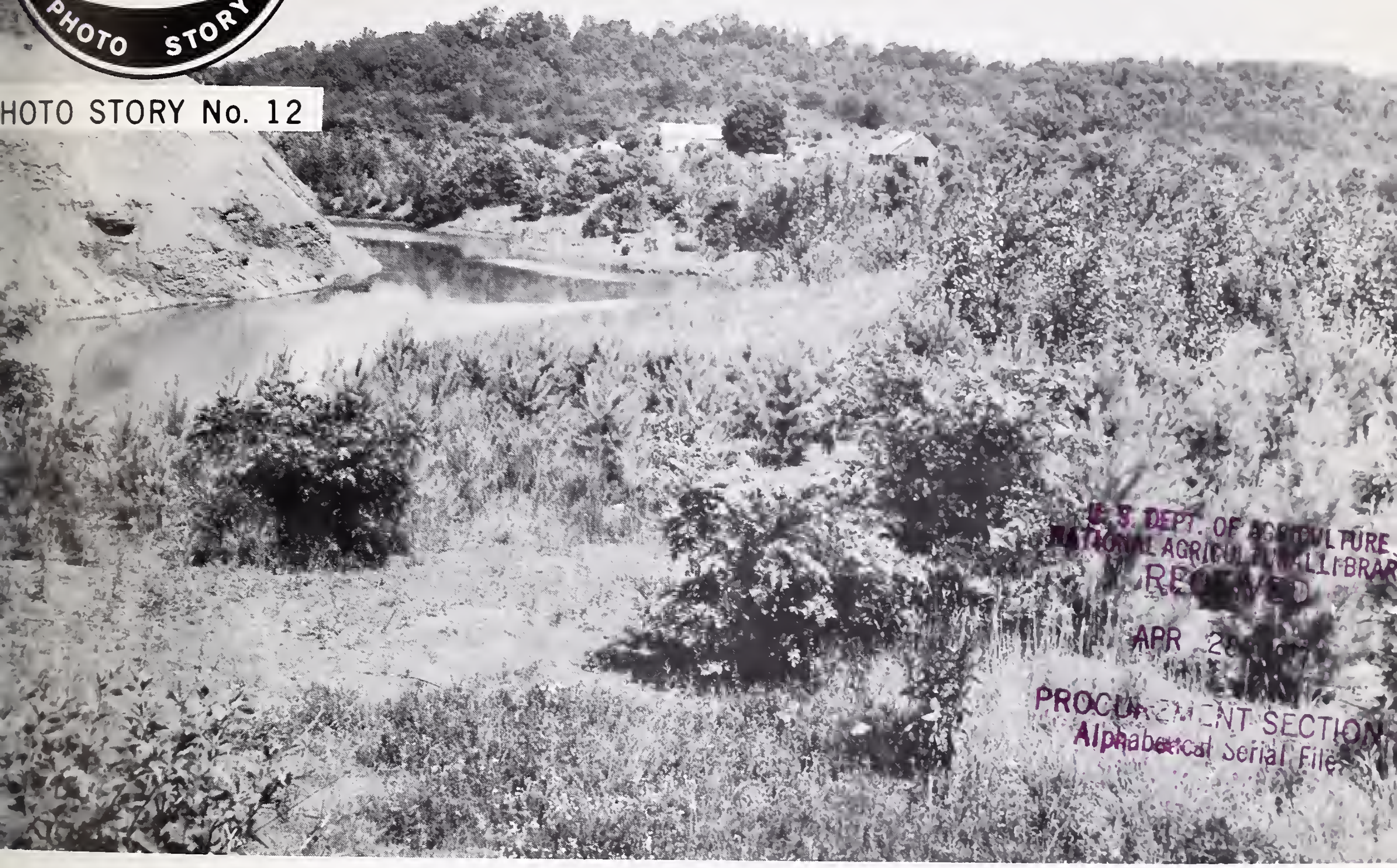
Green vegetation -- grasses, legumes, and trees -- enhance this landscape near London, Ky. The site was strip-mined in 1965. Successful planting efforts began in 1966.

HOTO STORY No. 12



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Forestry Research Helps Mine Spoils TURN GREEN

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After land has been strip-mined, it should quickly be revegetated -- not only for aesthetic reasons, but for some very practical reasons. Vegetation quickly established on mined land permits less erosion and less silt to wash into nearby streams. And new vegetation on mined land can be useful for other purposes, too, such as providing food and shelter for wild animals -- all while recapturing the natural beauty of the landscape.

Forest Service scientists are working to insure that lush green vegetation can be established on strip-mined coal spoils. A series of studies directed by Willis Vogel of the "Strip-Mined Area Restoration" Work Unit of the Northeastern Forest Experiment Station, Berea, Ky.,

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NORTHEASTERN FOREST EXPERIMENT STATION • UPPER DARBY, PENNSYLVANIA 19082

has been testing the response of various types of plants, especially grasses and legumes, to spoil materials since 1964.

Vogel now feels certain that weeping lovegrass is one answer to strip-mine revegetation problems. In tests in Kentucky and West Virginia, lovegrass has shown that it can provide cover faster on more kinds of spoil than any other type of plant. Lovegrass is more tolerant of acid conditions and will establish cover on dry sites and withstand summer stress better than other grasses and legumes normally planted on mine spoils.

In order to establish a quick cover of vegetation on mined sites, several soil amendments are often needed. As standard procedure, scientists recommend the application of nitrogen fertilizer. Many spoils require applications of phosphorus,too; however, potash fertilizer was not needed to establish cover on any of the spoils examined. On some extremely acid spoils liming is needed to reduce acidity. Even acid tolerant grasses like weeping lovegrass normally will not establish good cover on spoils more acid than pH 4.0.

Scientists have felt that it would be advantageous to plant grasses and trees at the same time soon after the completion of mining operations. With this simultaneous planting, grasses would provide quick initial cover and overall site protection, while trees could offer long-term cover and site protection, as well as commercial investment -- the possibility of realizing a second resource from mined-out lands. But there are difficulties in this combined planting, for the herbaceous growth, which dominates the area initially, often competes with the struggling young trees, impeding their early growth and lowering their chances for survival.

Early results of studies underway indicate that weeping lovegrass competes less with young tree seedlings than some of the other herbaceous species traditionally used to cover mined lands. Furthermore, after providing good initial cover, lovegrass will, after several years of growth, weaken and die. Thus, as the grass gets weaker the trees get stronger and eventually provide protection to the mined site.

For Forest Service scientists, the discovery of the benefits of weeping lovegrass for strip-mine site revegetation is only a start. They are now preparing to investigate other aspects of revegetation of strip-mines. First they hope to determine what is the minimum density of vegetation that is necessary for erosion control. Then they plan to go on to refine ways to reduce the competitive effect of the grasses and legumes on trees, so that mined areas can have both grasses and trees.

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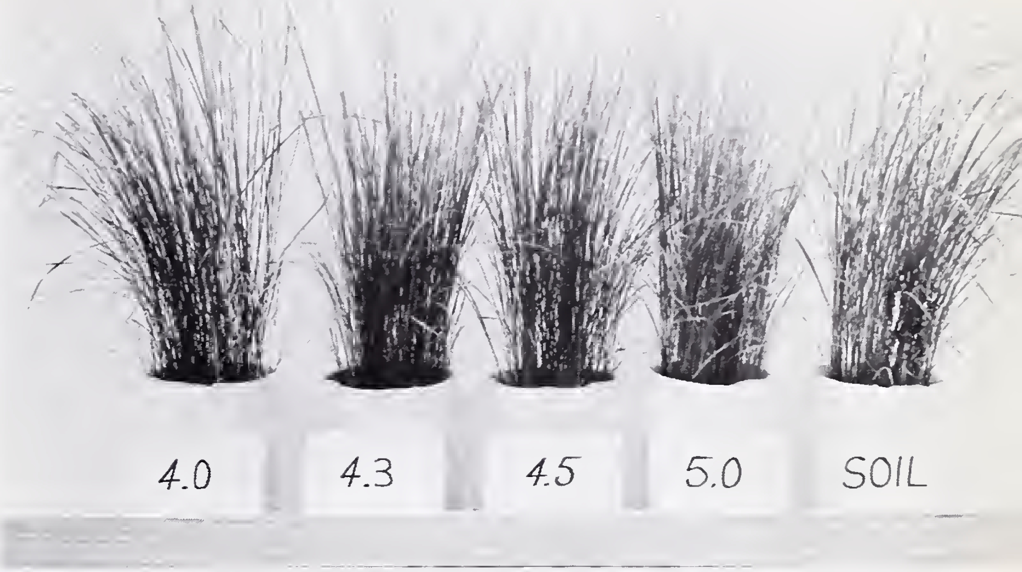

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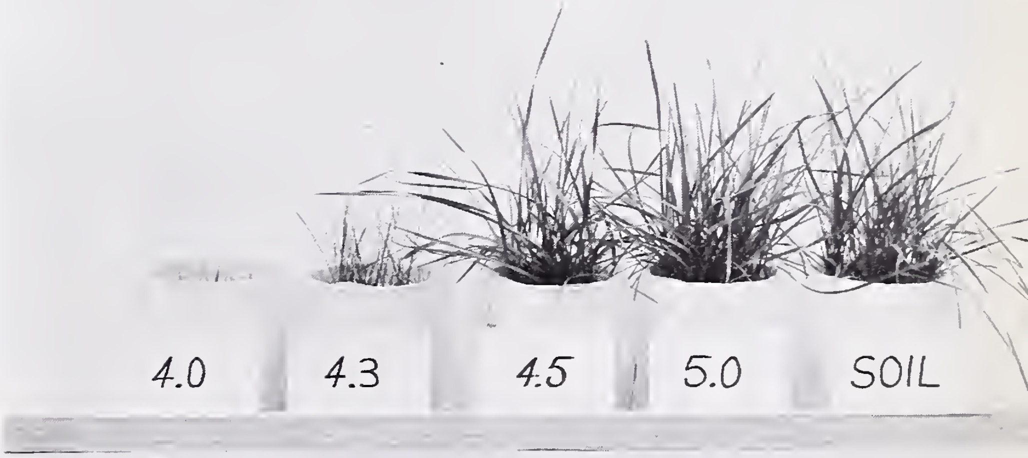
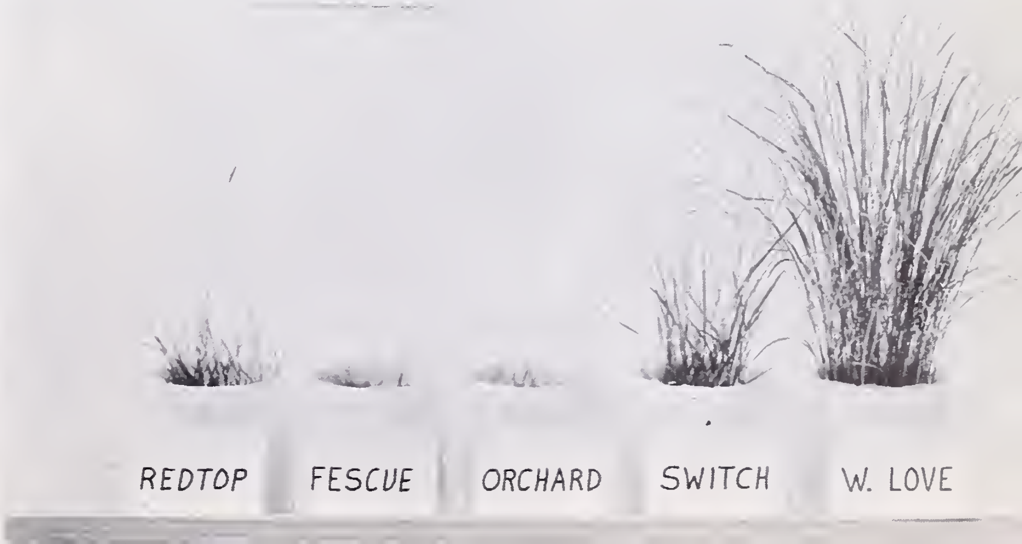


pH 4.0



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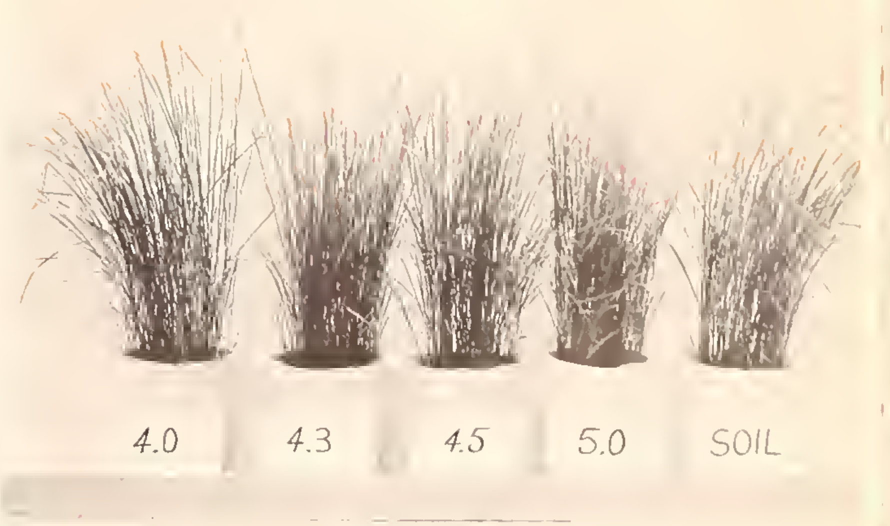

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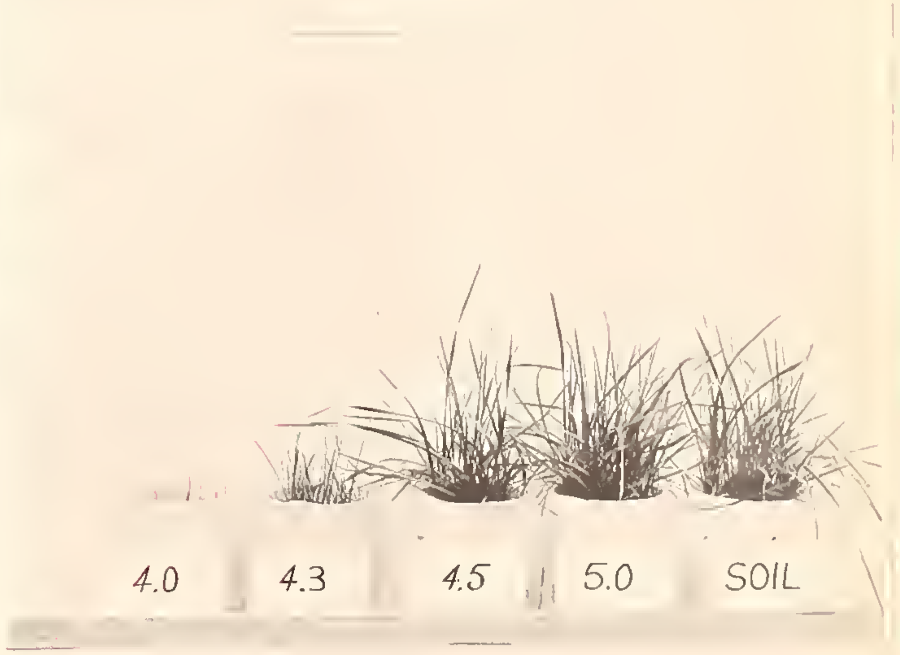

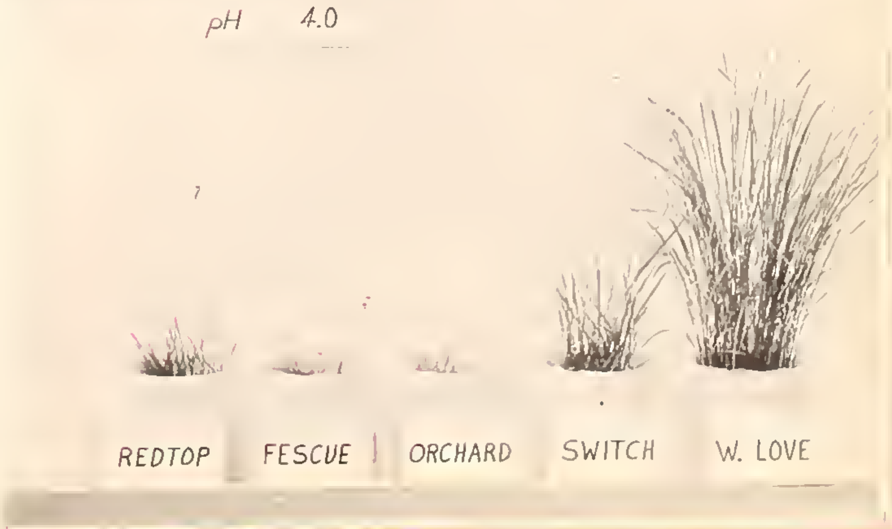

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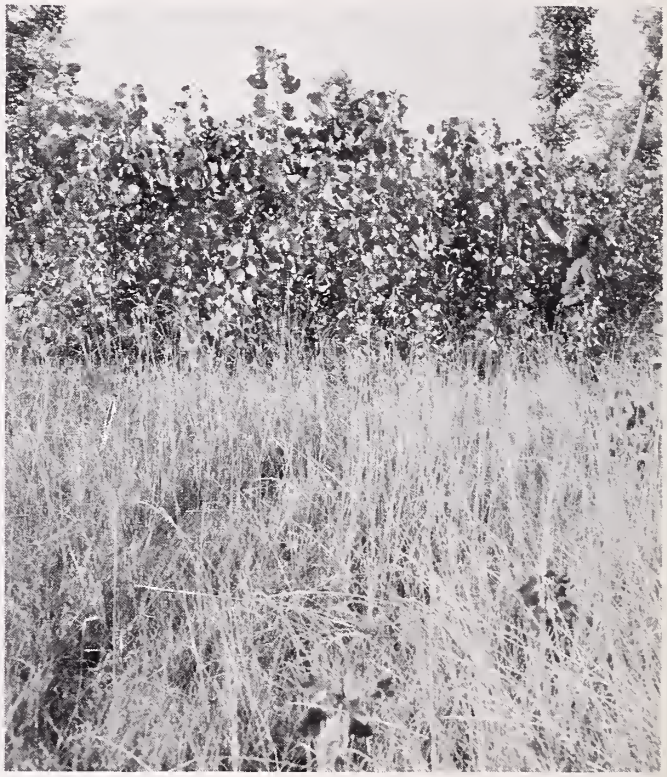
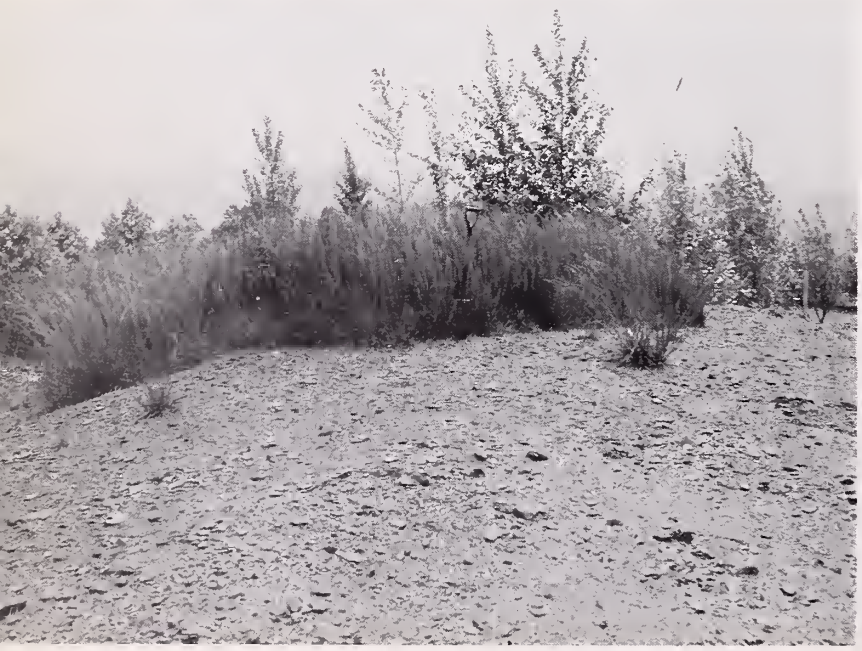
Weeping lovegrass carpets a former strip-mine bench.

When trees and grasses are planted simultaneously, they are forced to compete. The grasses, which grow faster with proper fertilization, often overtake the trees, so that tree growth slows and some mortality result. Here is a plantation of cottonwood trees. Cottonwoods in the foreground were planted amidst a mixture of tall fescue, sericea lespedeza, and lovegrass. Cottonwoods in the background were planted at the same time -- but alone and without the competition of the grasses.





Sericea lespedeza grows in a lush patch, following fertilization. Without the addition of nitrogen and phosphorus, this patch of herbaceous cover would be as bald as its neighborhood, which was also seeded, but not fertilized.